Hi Janice -thanks so much - let me know if anything is too cryptic

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From: Alers-Garcia, Janice
Sent: Wednesday, May 23, 2018 1:51 PM
To: Labiosa, Rochelle <labiosa.rochelle@epa.gov>
Subject: Re: Notes from the meeting

Rochelle,

Thank you very much! I will read over these as soon as I have a chance. Sorry I have not gotten the draft thank you notes to you. I've been pulled/distracted with other things.

Will do my best to get these in early next week.

Have a nice day,

Janice

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From: Labiosa, Rochelle
Sent: Wednesday, May 23, 2018 4:31:54 PM
To: Alers-Garcia, Janice
Subject: Notes from the meeting

Day 1 notes and next steps

Lester Yuan's talks

- *Thresholds needed at lower chla*
- *temporal variability - account for mgmt threshold e.g., 90% of time - easier to manage*
- *variability in sampling - quantify range; target percentile/frequency*
- *a priori classes help with communication/mgmt.*
- *spatial variability - strat unstrat; all relationships - ques - eutrophic/oligo/meso - (no ref cond mostly reservoirs)*
- *Follow-up on app interface - exceedance probability for microcystins- see how could be applied for states*
    - o *filling blanks at lower end for nutrients (prior to stressed);*
    - o *TBD journal articles - proposed revised - later 2019*
- *Follow up on Blake Schaeffer - rs data (filling in gaps) - accuracy sufficient;*
- *bayesian network seminar (talk to Lester)*

- Jack Oliver- comment for jack - re continuous data - actual examples of derivation would be helpful;

> *- how to derive relationships and then assess*
> *- pteropod example (?)*
> *- ambient data v. laboratory v. mesocosm; question re suggestions*

- wyoming approx 50 mcg/L TP-most data eutrophic; 35-40 to meet DO

Jim - timeseries data application

> *- would be good to see how rapid changes are compared to baseline trend changes*
> *- should de-trend for atmos impacts (ENSO/PDO)?*
> *- What are some best practices for states to consider in collecting and evaluating data? Is it best to target regular sites, based on random array or do random sites?*
> *- Follow up webinar on study design, application of some of the timeseries tools, and identify how short term v. long term trends should lead to same or different management actions*

Day 2 notes: multiple lines of evidence exercise only from Day 2

> *- Lakes - protected all uses (group 1); protected al use (group 2) 2 groups comparable chlorophyll a values (w/in order of magnitude); one looked at cyans and rec use; other did not (one group did meso/oligo; other looked at coldwater fish)*

- Estuaries 1 - identified mgmt endpoints; reducing/controlling HABs; improving DO--focused on eelgrass; match to thresholds; identify limiting factors (and endpoint that is most sensitive)

-- identified eelgrass mgmt objective; reviewed related TN/TP values. set mgmt goal at healthy eelgrass with associated nutrient conditions; eelgrass present v. absent - 0.39 TN mg/L. Survival of transplants could be good indicator.

- data gaps identified - residence time, streamflow, etc. Didn't know if statewide or site-specific; looked more regional.protection for seasonality- might set targets accordingly.

Estuaries 2 - process - helpful to have it compiled in one place. identified protection of all DU's - discussed most desirable use - commercial fisheries and rec (% nuisance, habs); reference distributions - 50%ile 0.02 TP 0.24 TN mg/L; kicked out two models with a bad R2

--model with higher R2 and still meeting 75%ile reference - 0.071 TP; 0.50 TN mg/L for higher concentrations. High chl 12 ug/L. NTE but chl measured during growing season. independent applicability.

Streams 1 -of the rec dw al uses - protected AL. TP magnitude 0.025 mg/L; weighted groups of evidence - went with state-collected data with more weight; used ref data as tier 2 and scientific literature as Tier 3 (validation).

graphed reg interpolation and CPs; all within narrow range - 0.03-0.06; regression interp were lower than CPs. may use reg interp prior to CP reached. looked at algae endpoint since most directly impacted by nutrients. macroinverts - too influenced by confounding factors

impaired sites even at 0.030 mg/L - set lower than the lowest impaired values. midpoint between 25th percentile impaired and 75th percentile references.

Streams 2 - reviewed uses - worked on a common use for states and tribes - coldwater aquatic life use-were provided ref data (presumed local), stress-response (presumed local) and literature values (not nec. local). Weighted local S-R highest; ref 75%ile second, and literature supporting (like group 1).

--impaired site percentiles and assessed sites known to be meeting uses. left out second - since assessment process can be coarse; instead focused on true ref. sites. Looked at N:P ratios - 35:1 - naturally P limited? leaned on response vars. closest to coldwater fish use - invert and tn tp; DO sensitivity - looked at all together; decided regression interpolated value (75%ile metric) - more

protective than CP metric. General values - did not use

concluded N and P both impt - identified TP 0.025 mg/L and TN value (need to add)

interesting some groups averaged across metrics; some took lowest/sensitive

feedback

- sample size was small for reference - would be hopeful to have more data than 15 statewide

- would be good to discuss sample sizes need to make good decisions.

- no way to value whether relationships/literature were good or bad; quality needs to be known

- one question to keep in mind - when to start thinking about combined criteria approach (given variability)

- scientists have tendency to try to identify a range of possible endpoints that could work, rather than the charge which was to identify the rules that should be used/process so somebody can recreate it

- - level of complexity in decision rules (can be difficult to identify decision rules given expertise/background)

Day 3 -

Anna - will send agenda from Erie meeting to Janice/Rochelle to share with the group

Biogas zero energy plant north bay- follow up with Deborah on possible webinar?

Implementation session

Kati Carberry

--Dixie drain -last 4% expensive to remove - TP only removal - 200 cfs; settling/alum;

- question - can see permit? How could be incorporated into permit or variance?

- is P recovery being done - talk about it; not sure about floc, but may be put in place for stormwater

-lot of interest in how this applied/implemented/results

Mike Suplee--Montana variances;

- q. long term average- for loads; how justified; what about waters with narrative criteria (can't say for certain waters criteria don't apply)

- plant optimizaton - reduced TN and TP quite a bit - request for follow-up webinar on the optimization side, and to include OWM/munis/states

- floating islands treatment for habs - small scale treatment- effects tbd (follow up discussion after experiment done)

- ques for states/tribes - prioritization tool useful? for identifying low hanging fruit for protection v. restoration

- request for info on variances/webinar follow-up

- incentivizing optimization - do you need numeric criteria to incentivize or are there reasons could be voluntary?

Dave Senn

sf bay - high nutrients, low chla; but threat of it - baywide permit; incentive to optimize/bubble allocate

-stormwater infrastructure - green infrastructure bmp; climate prep - baseline info across bmps

-threat of numeric criteria regional sf water board- led to upgrades

-website good, but webinars are very helpful - recorded classroom-style; overview of resources

--restoring/protecting if no point sources present (tribal waters); focus is on 319 support to do nonpoint source improvements

What about tribal waters with no PS present--if numeric criteria in tribal waters can be met downstream if upstream ps

Ques - which challenge in establishing marine nutrient criteria or improvement is most daunting; is it

TN limit setting due to low values compared to background; is it identifying baseline/reference condition- follow up discussion?

Anna Michalak - longterm landsat satellite imagery- 30 year - 9-yr longterm loading; internal recycling impt; and total reactive P - lake erie; implications important for management expectations

- is managing loading linked to managing landscape...and how does the resolution compare/useful to the scale of management decisions in the CWA programs?

- longterm hypoxia - linked to cumulative loading and internal recycling; springtime air temperature connection (link to cc); warming - more severe hypoxia (ques - are systems more sensitive to P)

- precip implications - interannual variability; management practices = spatial variability

- take home long term and consistent records important

internal recycling and temp/strat increase will result in long-term changes to aquatic ecology, coupled with impacts from increasing precip loads

Cheryl Brown -

- sparrow -shown to be accurate screening tool for reference conditions; compare favorably to isotope data; app for identifying anthro-nutrient thresholds could be developed?

Puget Sound nutrients talk

-macroalgae, phyto, jellyfish increases

-increased persistence in fecal bacteria

-changes in Si/N driving junk food transition point

-goal reduce exposure time and magnitude to low DO conditions

-DIN influencing exposure to low aragonite saturation state; question later on - how to support these broader regional modeling efforts to ensure complete evaluation of contributing sources

Hawaii - Lauren - SSC - any pushback on criteria development- would like to know lessons learned in communicating with the public?

Raphe Kudela:

Akashiwo - runoff-related blooms; largest mass bird mortality events (comparable to oil spills); huge aesthetic impacts

San lorenzo river - alexandrium - nodularia mixed bloom

99% of mussels SF Bay have at least 1 toxin present; 37% of mussels had all 4 toxins

multiple species producing multiple toxins

toxin concentrations lower in drought - via modeling - drought was reducing nutrients - decreased then increased;

marine - prefer ammonium or urea over nitrate; on decadal scales, % sf bay water- ammonium urea increasing/potl to increase toxicity by factor of 4

- nutrients species really important- species-specific endpoints;

Dave senn

- timeseries data - summer/fall 40-yr timeseries - chlorophyll a increasing around 2000, dec. sed, dec ben grazing (transition 2000, now stable)

-south bay - increase in chl

Coastal CA - Martha; 8 "pipes" of nutrients along the coast; upwelling drove conversation away from anthropogenic controls; OA already has reduced aragonite saturation state; Large scale models to help hone in on mgmt endpoints important to control

- WRF-ROMS coupled model - pacific basin scale - 12 km - 4km grid west coast- nested to 1km CA coast; smaller scale locally; 3-mos runtime; data-heavy

link to satellite data for predictive habs model

ocean forcing - difficult to develop

longterm data important; 30-35 yrs intermittent; 20 yrs timeseries; could not identify minimally disturbed areas; using laboratory experiments in combination with field/modeling

- how to live in a multiple stressor world; metabolic index measures, e.g., need to include temperature in DO assessment; hypoxia tolerance is temp -dependent

- how is population growth being incorporated?

- identified as important

Themes - long term data sf bay, PS, CA coast mechanistic modeling; statistical models

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